

The Shape Show

Reporting Category Measurement

Topic Investigating plane and solid geometric figures

Materials

- Small cube solids
- The Shape Show Recording Sheet (attached)
- Large vocabulary cards for the words *face*, *edge*, *vertex/vertices*, and *angle*
- Large display geometric solids: triangular pyramid, sphere, cube, rectangular prism
- Construction paper
- Scissors
- Tape
- Comparing Figures Chart (attached)

Vocabulary

vertices, vertex, angle, plane shape, triangle, rectangle, circle, square (earlier grades)
face, edge, solid figure, cube, sphere, rectangular prism, triangular pyramid (2.16)

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)

1. Ask each student to bring in one object from home that is three-dimensional but resembles a plane shape such as circle, square, or rectangle (e.g., cereal box, tennis ball, dice). Assemble these objects in the front of the room. Ask students how these objects could be sorted, and allow one or two minutes for students to think about ways to sort them. Have students share their ideas. The goal is for them to articulate how three-dimensional objects can relate to plane geometric shapes—a cube to a square, a rectangular prism to a rectangle, and a sphere to a circle.
2. Explain that students will be learning vocabulary to help them describe three-dimensional objects that relate to geometric shapes. Distribute cube solids, one to each student, and copies of The Shape Show Recording Sheet. Have students fill in “Cube” at the top of their sheets.
3. Post the vocabulary words cards on the board. Explain that a *face* is one side of a solid figure and that it may have a plane shape such as a square, rectangle, triangle, or circle. Model tracing a face of the triangular pyramid on construction paper. Next, ask students to count the number of faces on their cubes (6), to record this number on their recording sheets, and to trace all the faces. Ask how the faces are similar and how they are different.
4. Ask for thoughts about the next vocabulary word, *edge*. After thoughts are shared, explain that an *edge* is a line segment where two faces come together. Model tracing two faces of the triangular pyramid on construction paper, cutting them out, and using tape to join two

edges together. Next, ask students to count the number of edges on their cubes (12) and to record this number on their recording sheets.

5. Explain that the point where line segment edges come together is called a *vertex* (plural: *vertices*). Trace two more triangular faces, cut them out, and tape them together with the other triangular faces from step 4. A triangular pyramid has now been formed. Ask student volunteers to come up and point out the vertices they see on the triangular pyramid solid. Next, ask students to count the number of vertices on their cubes (8) and to record this number on their recording sheets.
6. Ask students to look at the edges on their cube and the edges on the triangular pyramid. Discuss the meaning of the word *angle*, and point out various angles formed at the edges of the cube and edges of the triangular pyramid. Ask guiding questions that will engage students in thinking about these angles. For example, ask, “What do the angles formed at the cube’s edges look like? Do they look like an alphabet letter (e.g., L)? What do the angles formed at the triangular pyramid’s edges look like? Do they look similar to the cube’s angles? Do they look different?” These questions should lead students to think also about the angles formed at the vertices. Have them record the angles of their cubes by sketching on their recording sheets.
7. Hold a class discussion about solid geometric figures (triangular pyramid, sphere, cube, and rectangular prism), using the vocabulary words from the activity. Review their faces, edges, vertices, and angles.
8. Have students describe the cube, using vocabulary words from the activity. Use descriptions as an assessment.

Assessment

- **Questions**
 - Why is it important that we use the vocabulary we learned today?
 - How can you describe a rectangular prism based on its faces, edges, vertices, and angles?
 - Does this solid figure look similar to any of the plane shapes we have learned about? If so, which one?
- **Journal/Writing Prompts**
 - Describe the solid figure that is on your table. Use the vocabulary words *face*, *edge*, *vertex*, and *angle*.
 - Your teacher investigated a triangular pyramid today. You investigated a cube. Describe how these solid geometric figures are similar and how they are different.

Extensions and Connections (for all students)

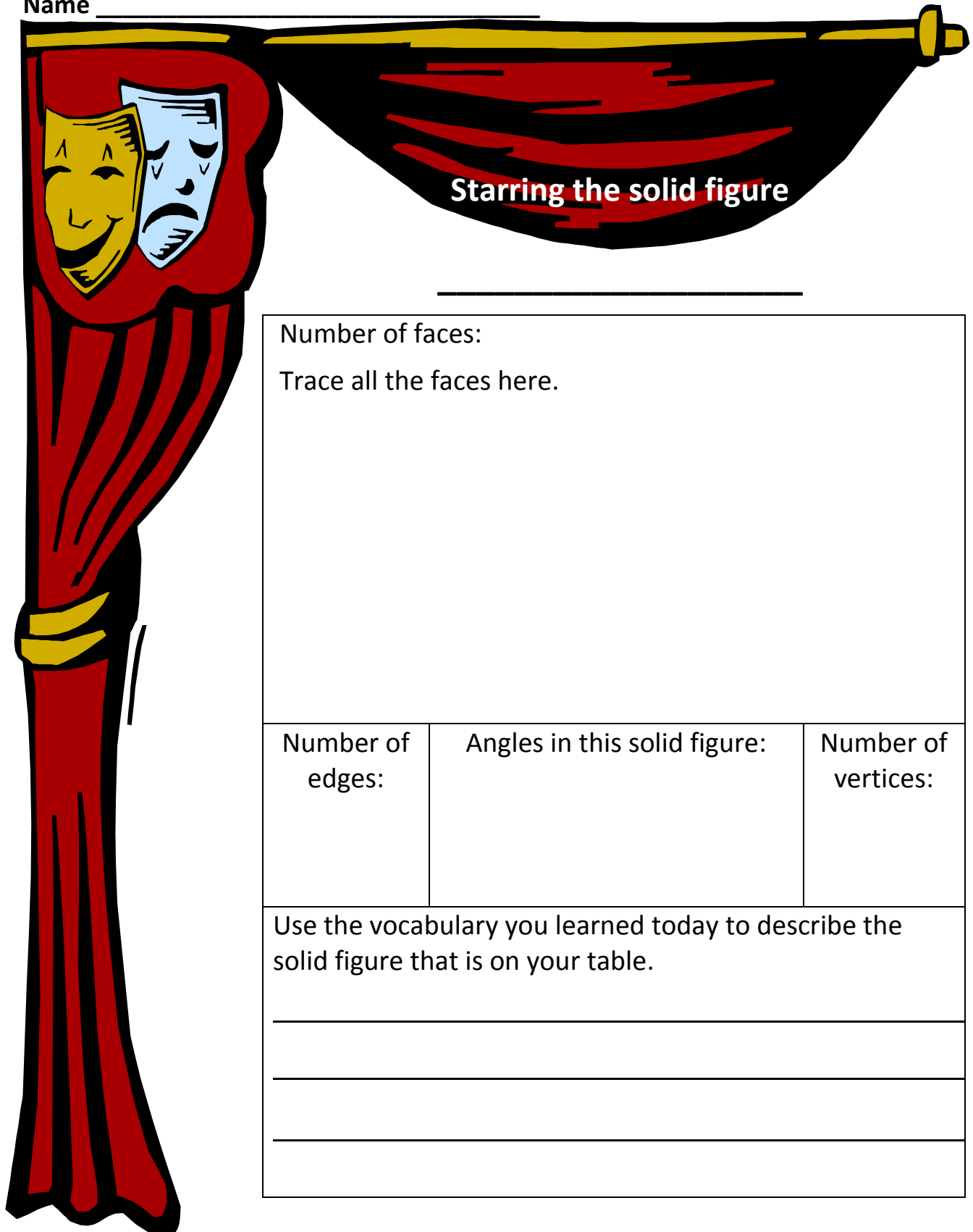
- Set up a learning station with a basket of solid figures where students can investigate more such objects. Distribute Comparing Figures Charts, and have students record data about the faces, edges, vertices, and angles found in the solid figures.
- Have students create model solid figures, using pretzels as the edges and mini marshmallows as the vertices. Guide students in creating each of the faces and then assembling the faces to create the solid figure.

Strategies for Differentiation

- To help students recognize the faces on a solid figure, allow student to coat the face in washable paint and then print it on paper. Encourage students to investigate whether there is more than one face shape in a given solid figure.

The Shape Show Recording Sheet

Name _____



Number of faces:

Trace all the faces here.

Number of
edges:

Angles in this solid figure:

Number of
vertices:

Use the vocabulary you learned today to describe the solid figure that is on your table.

Comparing Figures Chart

Name _____

Name of shape	Number of faces	Shape of faces	Number of edges	Number of vertices	Angles in figure